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SOME PROBLEMS IN CROCODILIAN NOMENCLATURE¹

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INTRODUCTION AND HISTORICAL SUMMARY

In the course of his study of the Crocodilia the senior author has come upon problems of complexity in the nomenclature of some of the living species. There has been much disagreement among authors of the last hundred years about the validity and applicability of some of the names used by early workers who followed Linnaeus.

We intend here to discuss the name of the North American crocodile, the Egyptian crocodile, and the South American species which belong to two or three genera and to the family Alligatoridae. The early works are so confused and involved that it would be impossible to arrive at a clear solution without being a little arbitrary. It seems most important to reach an interpretation of the situation based on the original uses and on subsequent usage and understanding, which may serve as an authoritative guide for future workers.

Solutions of these difficulties in nomenclature are proposed, then, to settle the controversies and give established names to the important species under discussion.

A brief history of these forms, as we have studied them from original sources, might be in order:

Linnaeus (1758:200) placed the crocodiles as one species of the genus *Lacerta*.

He gave a long list of synonyms and a wide habitat range for his *Lacerta crocodilus*.

Laurenti (1768:53-54) described the genus *Crocodylus* with four species, *niloticus*, *americanus*, *africanus* and *terrestris*, but designated no type species.

Blumenbach (1779:262-264) described two species: *Lacerta crocodilus* and *L. alligator*. In later editions (1807:244) he added *L. gangetica*.

Bonnaterre (1789:33-35) mentioned four species: le crocodile or *Crocodylus alligator* with three varieties, le gavial or *C. gavial*, le caiman or *C. cayman* and la Fouette Queue or *C. caudiverbera*.

The 13th edition of Linnaeus' "Systema Naturae," edited by Gmelin (1789:1056-57) listed three species: *L. crocodilus*, *L. alligator* and *L. gangetica*.

Then, in 1801, Schneider (159-170) described a number of species, establishing some of the living species. The species of Schneider involved in this discussion are: *porosus*, *trigonatus*, *sclerops*, *carinatus*, *palmatus*, *pentonyx* and the one he called *americanus* from a manuscript of Plumier.

The following year Daudin (1802:389-420) described a number of new crocodilians along with his description of already known ones. His American species were *Crocodylus caiman*, *C. yacare*, *C. mississippiensis* (sic.) and *C. latirostris*. In the same year Cuvier (1802:164) wrote his first paper on the crocodiles, in which he comments on the confusion met in studying this group of animals. The descriptions and characters accompanying the names used by the authors mentioned are so contradictory that even Cuvier, who was a contemporary of some of them, found it impossible to untangle the situation.

He very neatly avoided this difficulty by using NEW names for most of the species in his celebrated treatise on living species of crocodiles (1807:8-55). The Nile crocodile he called *Crocodylus vulgaris* (40) and the American, *C. acutus* (55), thus ignoring Laurenti's *niloticus* and *americanus*. Then he described a new species of "caiman" which he called *Crocodylus palpebrosus* (35) with two varieties, the second of which he thought might be identical with Schneider's

¹ Contributions to the Osteology, Affinities, and Distribution of the Crocodilia No. 32.

trigonatus (36). He discussed a second "caiman" as *Crocodylus sclerops* Schneider (31), and a third as *Crocodylus lucius* (du Mississippi) (29). For these three "caimans" he established the sub-genus *Alligator* (25) but designated no type species.

Merrem (1820:35-37) considered *Crocodylus niloticus* Laurenti a synonym of *Crocodylus trigonatus* Schneider, and followed Cuvier's use of *Alligator*. The Egyptian crocodile he called *Champse vulgaris*, and used *Champse acutus*, only, for the American crocodile. Thus he substituted his own generic name *Champse* for Laurenti's *Crocodylus* and ignored Laurenti's species *americanus*.

Bory de St. Vincent (1824:102) called *Lacerta crocodilus* L. and *Crocodylus americanus* Laurenti synonyms of *Alligator sclerops*.

Spix, in 1825 (1-4), described two new genera: *Jacaretinga* and *Caiman*, each containing two species, *moschifer* and *punctulatus* and *fissipes* and *niger*, respectively. No type species were mentioned in this case either.

Cuvier, in 1829 (II-23), listed three varieties of *Crocodylus sclerops*: *Jacaré noir* Spix, *Cr. fissipes* Spix and *Cr. punctulatus* Spix.

In 1830, Wagler (140) placed these as well as Cuvier's alligators in his genus *Champsia*.

Gray (1831:62-63) reunited Cuvier's varieties of *sclerops* into one species with a number of synonyms. He mentioned two varieties of *Alligator palpebrosus*; *J. moschifer* is a synonym of one, *Crocodylus niloticus* Laurenti of the second. Gray called the Nile crocodile *Crocodylus vulgaris* and listed five varieties: *suchus* Geoff., *marginatus* Geoff., *lacunosus* Geoff., *complanatus* Geoff. and *indicus* Cuvier. The American form he called *Crocodylus acutus* (58, 60).

Duméril and Bibron (1836:67-93) ascribed all the species of Wagler's *Champsia* to *Alligator* and added a species *cyncephalus*. They called the common Nile crocodile *Crocodylus vulgaris* (104) and considered Daudin's *niloticus* a synonym. They described four varieties: *vulgaris*, *palustris*, *marginatus* and *suchus*. For the American crocodile they used *Crocodylus*

acutus and considered Schneider's *Crocodylus americanus Plumieri* and the Plumier Manuscript Crocodile d'Amerique to be synonyms.

Natterer (1841:317) used Wagler's *Champsia* and described two more species: *vallifrons* and *gibbiceps*.

In 1844, Gray (64-67) established the family Alligatoridae for Cuvier's group of "caimans." He included three genera: *Alligator*, *Caiman* and *Jacare*. He listed only one species of *Alligator*: *mississippiensis* Daudin (Cuvier's *lucius* and Leach's *cuvieri*) but he placed in his *Jacare* the species called *Caiman* by Spix—i.e., *niger* or *noir*, and *fissipes*, while he placed in his *Caiman* the species *trigonatus* (Schneider) and *palpebrosus* (Cuvier); *Jacaretinga moschifer* is a synonym of the latter (Vaillant, 1893:219). THUS GRAY REVERSED THE USAGE AND MEANING OF SPIX'S TWO SOUTH AMERICAN GENERA.

Gray called the Egyptian crocodile *Crocodylus vulgaris* (61), and the American *Crocodylus americanus* Schneider ex Plumier with *C. acutus* Cuvier as a synonym.

In 1862, Gray (1:272) called the American crocodile *Molinia americana* when he broke the genus *Crocodylus* into subgenera. Then (2:328-330), he gave sub-generic names to his caimans and jacares: *Melanosuchus* for *nigra*; *Cynosuchus* for *latirostris*, *longiscutata*, *multiscutata*, *ocellata*, *punctulata*, and *hirticollis*; *Paleosuchus* for *trigonatus*; and *Aromosuchus* for *palpebrosus*.

Boulenger (1889:292) listed five species of *Caiman*: *niger*, *latirostris*, *sclerops*, *trigonatus* and *palpebrosus*. He left *Perosuchus fuscus* described by Cope in 1868 in its own separate genus. The Egyptian crocodile he called *Crocodylus niloticus*, with its variety names as synonyms (283), and the American he called *Crocodylus americanus* (281).

In 1893, Vaillant (219) designated *Jacaretinga moschifer* (= *palpebrosus* Cuvier) as type of *Jacaretinga*, and five years later (1898:171) used *Jacaretinga* as Boulenger had used *Caiman*.

Meanwhile, in 1896, Lönnberg (9), in cataloguing the Linnean type specimens existing in the zoological museum of the Royal University of Upsala, pointed out that the

type of Linnaeus' *Lacerta crocodilus* is a specimen of the species known as *Caiman sclerops*. Andersson (1900:5) also made this observation and stated that the Linnean name should therefore be applied to the South American species, which should then be called *Caiman crocodilus*.

In 1917, Stejneger and Barbour (41) designated the type for *Crocodylus Laurenti* as *niloticus* = *Lacerta crocodilus* Linné in part. These authors call the American crocodile *Crocodylus acutus* Cuvier, with *Crocodylus americanus* Cope as a synonym.

This designation of type was certainly necessary to properly establish the genus *Crocodylus*, but it brought to light a confusing problem which had been avoided by most writers for over eighty years:

Authors as far back as Merrem (1820:35) and Gray (1831:63) considered Laurenti's *Crocodylus niloticus* to be the same species as Schneider's *trigonatus*. If this were true, Laurenti's generic name *Crocodylus* could be used only for the South American species called *Jacaretinga* by Spix. Müller (1924:314, 319) suggested this necessity and did call the species known as *trigonatus niloticus*, but referred it to Gray's genus *Paleosuchus* (1862:329). He left *Crocodylus* as valid for the "true crocodiles," if *americanus* could be established as type species (which he doubted).

Schmidt (1928:208) rejected the suggested transfer of the generic name *Crocodylus* and the specific *niloticus* to the South American forms, but continued the use of *Paleosuchus* as *P. trigonatus* and *P. palpebrosus*. He designated *C. fissipes* (= *latirostris* Daudin) as type of *Caiman* Spix, and held *C. yacare* and *C. fuscus* as valid species. Kälin (1933:543) used *Paleosuchus*, and also *Caiman crocodilus* instead of *C. sclerops*.

However, in 1933, Werner (1:102, 104) carried out Müller's suggestion, transferred the generic name *Crocodylus* to the South American forms, the specific name *niloticus* to the species otherwise known as *trigonatus*, referred *niger* to Gray's genus *Melanosuchus* (1862:328) following the inference of Schmidt (1928:214) that the species possesses characters of distinct generic value, and used the generic name

Champse Merrem¹ for the "true crocodiles."

This paper of Werner's was no sooner off the press than Stejneger (1933:118) wrote a short paper to set aside the transfer. He held that *Crocodylus niloticus* as used by Laurenti is a composite or collective name, and that part of it may be used for the Nile crocodile, this part being, of course, the part of the composite which is the type species of *Crocodylus* and which in part = *Lacerta crocodilus*. Stejneger rejects Laurenti's *Crocodylus americanus* as unidentifiable, and uses Cuvier's name *Crocodylus acutus* for the American crocodile.

Finally, Patterson (1936:49) recognizes Stejneger's argument in setting aside Werner's transfer of names.

Some of these authors had their own illustrations, and some of the species were not figured. Many of them, particularly the earlier writers, referred their species to figures in plates of Seba's "Thesaurus," Vol. I:

Linnaeus:

Lacerta crocodilus Pls. 103, 104

Laurenti:

Crocodylus niloticus Pl. 105, figs. 3, 4

Crocodylus americanus Pl. 106

Crocodylus africanus Pl. 103, figs. 3, 4

Crocodylus terrestris Pl. 103, fig. 1; Pl. 104

Blumenbach:

Lacerta alligator Pl. 106; in 1779

Lacerta alligator Pl. 104, fig. 10; in 1807

Schneider:

(*Crocodylus*) *porosus* Pl. 104, fig. 12

(*Crocodylus*) *trigonatus* Pl. 105, fig. 3

(*Crocodylus*) *sclerops* Pl. 104, fig. 10

(*Crocodylus*) *carinatus* Pl. 103, fig. 1

(*Crocodylus*) *palmatus* Pl. 104, fig. 12

(*Crocodylus*) *pentonyx* Pl. 103, fig. 1; Pl. 104

Stejneger (1933:119-120) analyzed these plates and Laurenti's species with the following results:

Pl. 103: fig. 1—*Crocodylus biporcatus* (*porosus*)
acc. to Cuvier

2—Lizard (feet characters)

3, 4—unidentifiable crocodilian

Pl. 104: figs. 1-9—*C. acutus*

10—*C. sclerops*

11—unidentifiable

12—*porosus* acc. to Cuvier; *acutus* acc. to Duméril and Bibron

Pl. 105: fig. 3—*C. trigonatus*

¹ In one place in this paper (p. 106) Werner mentions *Champse* Wagler as the generic name of the "crocodiles." This is apparently an uncorrected error in the paper, as *Champsa* Wagler is, of course, an alligatorid generic name, and as Werner uses *Champse* Merrem, correctly elsewhere.

4—not *trigonatus*, probably *C. vulgaris* Cuvier
Pl. 106: unidentifiable crocodilian

These, then, are the essential facts in the literature upon which we have based our study and interpretation.

THE NILE CROCODILE AND THE GENUS *CROCODYLUS*

The Egyptian crocodile of the Nile has been known and mentioned in literature from very early times. The 10th edition of Linnaeus' "Systema Naturae" (1758:200), which is the basis of modern zoological nomenclature, lumped all the crocodiles in the species of lizard *Lacerta crocodilus*, included "Africa" as a habitat, and made reference to a *Crocodylus niloticus* as a synonym. Ten years later Laurenti (1768: 63-64) described the genus *Crocodylus* with four species: *C. niloticus*, *C. americanus*, *C. africanus* and *C. terrestris*, but designated no type species for the genus. No type was selected by subsequent authors until 1917 when Stejneger and Barbour designated "*Crocodylus*, type: *niloticus* = *Lacerta crocodilus* L. in part." This species *niloticus* was figured by figs. 3 and 4 of Pl. 105 of Seba's "Thesaurus." It was selected as the type because it was the only identifiable species included by Laurenti in his genus, *africanus* and *terrestris* having long been considered unidentifiable, and *americanus* having been the cause of much controversy.

For the next few years this name and the Linnean name *Lacerta crocodilus*, or more commonly "Crocodile du Nil," were used for this species. Then, in 1801, Schneider, in describing the South American species *trigonatus*, said the latter was illustrated by fig. 3 of plate 105 of Seba's "Thesaurus," figs. 3 and 4 of this plate having been used by Laurenti to illustrate his *niloticus*. Many subsequent authors have confirmed this illustration.

In 1802, Daudin (367) described the crocodile of the Nile as *Crocodylus niloticus*. The same year Cuvier (1802:168) said that the fig. 3 in question represented the South

We will consider, first, the question of the specific name of the common, Nile, or Egyptian crocodile and the generic name *Crocodylus*, then the name of the American crocodile, the specific name *crocodilus*, and lastly the South American tangle.

American species. He felt that the other figure was unidentifiable, and therefore in 1807 (40) proposed the new name *Crocodylus vulgaris* for the Egyptian crocodile.

We have then a choice of three names for the Egyptian crocodile: *Crocodylus crocodilus* (L.), *Crocodylus niloticus* Laurenti (or Daudin), or *Crocodylus vulgaris* Cuvier. The first mentioned is eliminated for the reasons discussed below, so the choice must be made between the specific name *niloticus* and *vulgaris*. It must also be remembered that *niloticus* is the type species of *Crocodylus* and that if this is the specific name of the South American species, the generic name must also be transferred to that form.

Analysis of Laurenti's *Crocodylus niloticus* shows that the name is a collective or composite name because: (a) two very different habitats "Egypt and Oriental India" are given, and (b) the tails of the two figures in question are quite different, indicating that two species are represented. Schneider's *trigonatus* was believed to have come from India (Cuvier, 1807:35) and fig. 3 is definitely an illustration of that species. Therefore the form usually called *trigonatus* is unquestionably a part of the *niloticus* composite. On the other hand fig. 4 is without doubt another species and could well be the Nile crocodile. Furthermore, the habitat "Egypt" clearly indicates the "common" crocodile.

We therefore propose to hold the name *Crocodylus niloticus* Laurenti for the Egyptian crocodile keeping the genus *Crocodylus* for the true crocodiles, and to call the South American form *trigonatus* = *Crocodylus niloticus* Laurenti in part. The generic name of this latter species will be discussed below.

THE NORTH AMERICAN CROCODILE

The North American crocodile has had a very confusing nomenclatorial history. "America" was included as a habitat of

Linnaeus' *Lacerta crocodilus*, and figs. 1-9 of Seba's plate 104, also quoted by Linnaeus, are recognized as developments of a

young individual of the species in question. Furthermore, one of the original type specimens of Linnaeus is probably a very young stage of this species, according to Andersson (1900:5). Therefore the American crocodile was certainly a part of the "*Lacerta crocodilus*" complex.

Laurenti (1768:54) described *Crocodylus americanus*. His description was very brief and general and the figure he quotes (Seba, Pl. 106) is vague. Blumenbach (1779:263) described a species, *Lacerta alligator*, which he later (1799:233) referred to the same figure, and which has an equally poor description. Bonnaterre (1789:35) described *C. caudiverbera* or La Fouette-Queue. His description is no more diagnostic than the previous.

In 1801, Schneider published a description of a *Crocodylus americanus* from manuscript of Plumier. Unfortunately the description is largely biological and cannot be restricted to the species in question.

In 1807, Cuvier (55) described and figured the crocodile of North America as *Crocodylus acutus*.

The choice of names is, then, *Crocodylus americanus* Laurenti, *Lacerta alligator* Blumenbach, *Crocodylus caudiverbera* Bonnaterre, *Crocodylus americanus* Schneider ex Plumier Mss. and *Crocodylus acutus* Cuvier.

The case for *Crocodylus americanus* Laurenti rests on the identification of the Seban plate, since the description Laurenti gives is so general it might apply to any crocodilian. This plate however is grossly inaccurate. The number of toes on the hind foot is incorrect, there are too many teeth

for a true crocodile and they are too uniform to be either crocodilid or alligatorid. The scales and scutes are too stylized to be identified. The plate is therefore considered indeterminate. Furthermore this name is confused with the South American *Caiman crocodilus*. Bory de St. Vincent (1824:102) and others considered the Laurentian species to be a synonym of *Crocodylus sclerops*.

The description and figure render *Crocodylus caudiverbera* Bonnaterre equally indeterminate.

Schneider's use of *Crocodylus americanus* (ex Plumier) has been followed by some (Gray, 1844:60; Boulenger, 1889:281). This description is long and complicated and hardly specific enough for identity. It is not figured. We therefore remove it from further consideration.

We are left, then, with *Crocodylus acutus* Cuvier. This species is well defined and figured. The name has been used by many authors. However, other workers have used other means of designation of this species. Gray (1844:60) used *americanus* Schneider ex Plumier and Boulenger did the same (1889:281), listing *Crocodylus americanus* Laurenti as a "synonym." Cope used *Crocodylus americanus* Laurenti and others, Ditmars and Stejneger and Barbour, have followed him. In recent years it appears that zoologists have used Cuvier's name and palaeontologists have used Laurenti's. Since the latter has been found to be inadequately founded, *Crocodylus acutus* Cuvier should be considered the name of the North American crocodile.

THE LINNEAN SPECIES: *LACERTA CROCODYLUS*

The term *Lacerta crocodilus* as used by Linnaeus is a composite name, as no one species is known which inhabits "Asia, Africa, America," and as many species are represented by the Seban plates quoted (103 and 104).

The name was commonly used by early writers (Hasselquist, etc.) to indicate the Nile crocodile. It could be used to replace any of these names as they were figured in the plates by the original authors: *terrestris* and *africanus* of Laurenti, *porosus*,

sclerops, *carinatus*, *palmatus* and *pentonyx* of Schneider, or as illustrated by some of the figures—*vulgaris*, or *acutus*.

However, in 1896, Lönnberg (9), in cataloguing existing Linnean type specimens, pointed out that the type of *Lacerta crocodilus* L. is a specimen of the species known as *Caiman sclerops* which name had been confused with other species. Andersson (1900:5), in continuing Lönnberg's work, confirmed the identity of the type and added that a second jar labeled *L. crocodilus*

is probably a *C. acutus*. These two specimens and the lists of habitats led Andersson to conclude that Linnaeus' *Lacerta crocodilus* was a collective name and that it should be applied to the species to which the type belongs. This view is also held by Stejneger (1901:394) who corrected Fox's

(1901:232) opinion that the name should be applied to the Nile crocodile.

We here accept the name *Caiman crocodilus* (L.) as used by Andersson, but point out that since the original specific name is a composite it is involved in the synonymy of other forms.

THE SOUTH AMERICAN CAIMANS

Among the first crocodiles to be described as distinct species were *trigonatus* and *sclerops* of Schneider (1801:161-164). Daudin (1802:397-420) described several species which are involved in our present discussion: *Crocodylus caiman*, *C. yacare*, *C. mississippiensis*, and *C. latirostris*. Cuvier (1807:25) separated these from the "true crocodiles," putting them in his subgenus, *Alligator*, and calling them *lucius*, *sclerops*, and *palpebrosus*, the last being a newly described species with two varieties, the second of which equals *trigonatus*.

Spix (1825:1-4) in publishing the results of his studies of South American reptiles, described two genera of crocodiles: *Jacaretinga* with *J. moschifer* and *J. punctulatus*, and *Caiman* with *C. niger* (or *noir*) and *C. fissipes*. He, of course, designated no type species for either genus.

Gray (1831:63) discussed three species of *Alligator*: *mississippiensis*, *sclerops*, and *palpebrosus*. He divided *sclerops* into three varieties: *Caiman niger* Spix, *Caiman fissipes* Spix and *Jacaretinga punctulatus* Spix; and *palpebrosus* into two: *palpebrosus* and *trigonatus*. *Crocodylus niloticus* Laurenti (Seba, I, Pl. 105, 3) is a synonym of the last.

Duméril and Bibron (1836:63-93) also discussed this group. They described five species of *Alligator*: *palpebrosus* Cuvier (two varieties, *J. moschifer* Spix, a synonym of the first, *Crocodylus trigonatus* Schneider of the second), *lucius* Cuvier (*mississippiensis* Daudin), *sclerops* (syn. = *Jacare noir* Spix), *cynocephalus* (*fissipes* Spix) and *punctulatus* Spix.

Natterer (1841:316-320) discussed *Champsia lucius* from North America, and eight species from South America: *Champsia nigra* (Spix's *Caiman niger* and Daudin's *Crocodylus yacare*), *Champsia*

fissipes (Spix's *Caiman fissipes*, Daudin's *latirostris*), *Champsia sclerops* (Schneider's *Crocodylus sclerops*, Daudin's *Crocodylus caiman*), *Champsia vallifrons*, *Champsia punctulatus*, *Champsia palpebrosus*, *Champsia triginata* and *Champsia gibbiceps*.

In 1844, Gray (64-67) established the family Alligatoridae with three genera. He placed *lucius* or *mississippiensis* alone in the genus *Alligator*, thus removing it from our discussion. The other genera he called *Caiman* and *Jacare*. Unfortunately he placed *palpebrosus* and *trigonatus* in the former and *sclerops*, *fissipes*, *nigra*, *punctulata*, and *vallifrons* in the latter, thus REVERSING SPIX'S ORIGINAL USE OF THE TERMS AND CAUSING CONFUSION IN THE NOMENCLATURE FOR ALMOST A CENTURY.

In 1862 and 1869, Gray (328-330; 165) added the species *longisculata*, *multisculata*, *ocellata* and *hirticollis* to *Jacare*, created the subgeneric name *Melanosuchus* for *nigra* and *Cynosuchus* for the others. He divided his *Caiman* into two subgenera: *Paleosuchus* (*trigonatus*) and *Armosuchus* (*palpebrosus*).

Boulenger (1889:292) listed five species of *Caiman*: *niger*, *latirostris*, *sclerops*, *trigonatus* and *palpebrosus*. Vaillant (1893: 217-219) discussed this group and said that Gray's *Jacare* included Spix's *Caiman fissipes* and *niger* plus his *Jacaretinga punctulata* (= *sclerops*), that *Jacaretinga moschifer* is then the type species of *Jacaretinga* Spix (or Gray's *Caiman*) and that *moschifer* = *palpebrosus*. He therefore used the name *Jacaretinga* for the species Boulenger called *Caiman*.

In 1924, Müller (319) suggested that if *Crocodylus niloticus* Laurenti (Seba, I, Pl. 105, figs. 3, 4) should be the same species as Schneider's *trigonatus* (Seba, Pl. 105, fig. 3) the South American genus would be

Crocodylus with *niloticus* and *palpebrosus* as the two species (i.e., type of *Crocodylus* = *niloticus*, Stejneger and Barbour, 1917:40).

Schmidt (1928:208) discussed five species of *Caiman*: *niger*, *latirostris*, *yacare*, *fuscus* and *sclerops*; and two species of *Paleosuchus*: *trigonatus* and *palpebrosus*. He used *Caiman* following Boulenger, stating this usage took precedence over Vaillant's use of *Jacaretinga*, designated *fissipes* (= *latirostris*) as type species of *Caiman*, and used the specific name *sclerops* rather than *crocodilus* as the latter is a composite. He suggested that the species *niger* possessed characters of such distinction that it might be placed in a separate genus. He rejected Müller's use of *Crocodylus niloticus* as unsatisfactory and confusing.

Five years later, Werner (1933:103) applied the generic name *Champse* Merrem to the true crocodiles, used *Crocodylus* for the two South American species, used *Jacaretinga* for *sclerops*, or rather, *crocodilus* which he divided into three subspecies, and for *latirostris*, and placed *niger* in its own genus, *Melanosuchus*.

Stejneger (1933:118) immediately re-

futed this argument, and analyzed the Laurentian species, holding the name *niloticus* for the Egyptian crocodile.

After examination of the literature and the characters of the forms involved, the authors have come to this solution of the situation:

There are three genera of South American Crocodilia, all belonging to the family Alligatoridae. They are: *Caiman* Spix, *Melanosuchus* Gray and *Jacaretinga* Spix.

Caiman Spix includes the type species which was designated by Schmidt—*fissipes* = *latirostris*, *crocodilus* (*sclerops*), *fuscus* and *yacare*. *Melanosuchus* Gray is used as the generic name of *niger*, following the suggestion of Schmidt and the work of Werner. *Jacaretinga* Spix includes the type species designated by Vaillant—*moschifer* = *palpebrosus* and *trigonatus*. It might be well to point out that *Jacaretinga* takes precedence over *Crocodylus* as the generic name of the South American species even had *niloticus* proved to be the name of the South American form, as its type species was designated first and it was therefore established first.

SUMMARY OF DETERMINATIONS AS ANNOUNCED IN THIS PAPER

FAMILY CROCODYLIDAE:

Genus *Crocodylus* Laurenti, 1768

Type: "*niloticus* = *Lacerta crocodilus* Linné in part" designated by Stejneger and Barbour, 1917

1.—*Crocodylus niloticus* Laurenti, 1768

Syn. *Crocodylus niloticus* Daudin, 1802
Crocodylus vulgaris Cuvier, 1807
Other synonyms not in the scope of this paper

2.—*Crocodylus acutus* Cuvier, 1807

Syn. ? *Crocodylus americanus* Laurenti, 1768
? *Lacerta alligator* Blumenbach, 1779
? *C. caudiverbera* Bonnaterre, 1789
? *Crocodylus americanus* Schneider (ex Plumier), 1801
Other synonyms not in the scope of this paper

FAMILY ALLIGATORIDAE:

Genus *Jacaretinga* Spix, 1825

Type: "*Jacaretinga moschifer* = *Caiman palpebrosus*" Cuvier designated by Vaillant, 1893

1.—*Jacaretinga trigonatus* (Schneider)

Syn. *Crocodylus niloticus* Laurenti, 1768, in part

Crocodylus trigonatus Schneider, 1801

Crocodylus palpebrosus var. 2 Cuvier, 1807

Alligator trigonatus (Schneider) Merrem, 1820

Champsia trigonata (Schneider) Wagler, 1830

Alligator palpebrosus var. b (Cuvier) Gray, 1831

Caiman trigonatus (Schneider) Gray, 1844

" (*Paleosuchus*) *trigonatus* Schneider) Gray, 1862

Jacaretinga trigonatus (Schneider) Vaillant, 1893

Paleosuchus niloticus (Laurenti) Müller, 1924

Paleosuchus trigonatus (Schneider) Schmidt, 1928

Crocodylus niloticus (Laurenti) Werner, 1933

2.—*Jacaretinga palpebrosus* (Cuvier)

Syn. *Crocodylus palpebrosus* var. 1 Cuvier, 1807

Alligator palpebrosus (Cuvier) Merrem, 1820

Jacaretinga moschifer Spix, 1825

Champsia palpebrosa (Cuvier) Wagler, 1830

Champsia gibbiceps Natterer, 1841

Caiman palpebrosus (Cuvier) Gray, 1844

Caiman gibbiceps (Natterer) Gray, 1844

Caiman (Aromosuchus) palpebrosus (Cuvier) Gray, 1862

Jacaretinga palpebrosus (Cuvier) Vaillant, 1893

Paleosuchus palpebrosus (Cuvier) Müller, 1924

Crocodylus palpebrosus (Cuvier) Werner, 1933

Genus *Caiman* Spix, 1825

Type: "*fissipes* (= *latirostris*)" designated by Schmidt, 1928

1.—*Caiman crocodilus* (L.)

Syn. *Lacerta crocodilus* Linnaeus, 1758, in part

Crocodylus sclerops Schneider, 1801

Crocodylus caiman Daudin, 1802

? *Lacerta alligator* Blumenbach, 1807

Alligator sclerops (Schneider) Merrem, 1820

Jacaretinga punctulatus Spix, 1825

Champsia sclerops (Schneider) Wagler, 1830

Champsia punctulata (Spix) Wagler, 1830

Alligator punctulatus (Spix) Dumeril and Bibron, 1836

Champsia vallifrons Natterer, 1841

Jacare sclerops (Schneider) Gray, 1844

Jacare punctulatus (Spix) Gray, 1844

Jacare vallifrons (Natterer) Gray, 1844

Jacare (Cynosuchus) punctulata (Spix), Gray 1862

Jacare longiscutata Gray, 1862

Jacare multiscutata Gray, 1869

Jacare hirticollis Gray, 1869

Alligator lacordairei Preuhomme de Borre, 1869

Caiman sclerops (Schneider) Boulenger, 1889

Jacaretinga sclerops (Schneider) Vaillant, 1893

Caiman crocodilus (L.) Andersson, 1900

Jacaretinga crocodilus (L.) Stejneger, 1901

Jacaretinga crocodilus crocodilus (L.) Werner, 1933

2.—*Caiman yacare* (Daudin)

| Syn. *Crocodylus yacare* Daudin, 1802

Champsia sclerops Natterer, 1841 (non Schneider)

Jacare sclerops (Schneider) Gray, 1844, in part

Jacare ocellata Gray, 1862

Caiman sclerops (Schneider) Boulenger, 1889, in part

Caiman yacare (Daudin) Schmidt, 1928

Jacaretinga crocodilus jacare (Daudin) Werner, 1933

3.—*Caiman latirostris* (Daudin)

Syn. *Crocodylus latirostris* Daudin, 1802

Crocodylus sclerops Wied, 1825 (non Schneider)

Caiman fissipes Spix, 1825

Alligator sclerops (Schn.) var. *fissipes* (Spix) Cuvier, 1829

Champsia fissipes (Spix) Wagler, 1830

Alligator cynocephalus Dumeril and Bibron, 1836

Jacare fissipes (Spix) Gray, 1844

Jacare latirostris (Daudin) Gray, 1862

Alligator latirostris (Daudin) Strauch, 1866

Caiman latirostris (Daudin) Boulenger, 1889

Jacaretinga latirostris (Daudin) Vaillant, 1898

4.—*Caiman fuscus* (Cope)

Syn. *Perosuchus fuscus* Cope, 1868

Alligator (Jacare) chiapasius Bo-court, 1876

Caiman sclerops (Schneider) Boulenger, 1889, in part

Jacaretinga sclerops (Schneider) Vaillant, 1898, in part

Jacare sclerops (Schneider) Mook, 1921, in part

Caiman fuscus (Cope) Schmidt, 1928

Jacaretinga crocodilus fuscus (Cope) Werner, 1933

Genus *Melanosuchus* Gray, 1862

Type: *Caiman niger* Spix (*Jacare nigra* Gray) was the only species included by Gray in his sub-genus *Melanosuchus* and it therefore becomes the type species of the genus *Melanosuchus*.

Melanosuchus niger (Spix)

Syn. *Caiman niger* Spix, 1825

Alligator sclerops (Schneider) var. *niger* (Spix) Cuvier, 1829

Champsia nigra (Spix) Wagler, 1830

Alligator niger (Spix) Owen, 1840-45

Jacare nigra (Spix) Gray, 1844

Jacaretinga niger (Spix) Vaillant, 1898

Melanosuchus niger (Spix) Werner, 1933

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